

NOTES ON SOME INDIAN MACAQUES

BY

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(With 5 plates and 1 text-figure).

INTRODUCTION.

There are perhaps few of the larger mammals so difficult to describe accurately as the monkeys in general. They are extremely varied in form and colour. What adds greatly to this difficulty is our lack of knowledge of the various colour-phases and forms they pass through from birth to maturity. In some instances there is a distinct difference between the sexes. Monkeys have been kept in captivity from the earliest times and many of the scientific descriptions have been based on captive specimens, which are, generally speaking, not at their best. Not a few descriptions have been based on poorly preserved material. To add to all this, there is yet another factor which is seldom taken into consideration, namely, the fading of skins in even the best preserved collections. Much also depends on the way the skins have been dried in the field. Experience both in the field and with museum collections has shown me that very often the most carefully preserved specimens fade in a short time; the specimens appearing unlike what they did in the flesh. The colour of the soft parts offer another stumbling block. Unless the colours are noted immediately after the animals are shot, they are frequently lost, as they fade rapidly after death. The colours of the face and hindquarters are generally accentuated in breeding individuals, a sign of sexual maturity. Immature individuals do not exhibit this trait. In the off-breeding season the colours diminish in tone or disappear.

In my opinion, the length of fur is of little or no specific importance. There is frequently a greatly marked variation in its colour and length, possibly due to season, and age. Local conditions also play an important rôle. Unfortunately, these factors only impress themselves on the field-worker after he has had varied experience. The factors taken conjointly make matters doubly difficult for the museum systematist, who has to rely on dried skins and what notes the collector may have made. Here it is that we can find an excuse for the very often incomplete and inadequate descriptions. Today it is very important that quality and not quantity collecting is required and to achieve this, mere skinners are not satisfactory.

Monkeys vary so much *inter se* in the same troop and at different ages and seasons that even the most detailed description of a single individual will not suit the next. When making a description it is perhaps a good plan to record the time of the year

when the specimens were collected. This I think will help somewhat. Until such time as we are able to connect up the seasonal, local and age variation, a general description will have to suffice. What is most desirable is to collect series of species from newborn to adult whenever possible. In some species the coat and cranial characters are very different in the sexes as will be seen in the plate illustrating the skulls of the Stump-tailed Macaque (*M. speciosa* F. Cuv.) Pl. IV. In such cases it would be useful to have separate descriptions for those characters of the female and young which are not exhibited by the male.

In this paper I will deal principally with the Stump-tailed Macaque (*M. speciosa*) over which there is apparently much confusion. I shall refer to the Pig-tailed Macaque (*M. nemistrina* sub. sp.), the Rhesus Macaque (*M. mulatta*), and the Bonnet Macaque (*M. radiata*), only in order to record such observations as have come to my notice.

MACACA SPECIOSA F. Cuv.

The Stump-tailed Macaque.

Macacus speciosus, F. Cuv. Hist. Nat. des Mammif. Fev. 1825, pl. xlv.

Macacus arctoides, Is. Geoff. St. Hil. Mag. de Zool. 1833, cli, pl. ii.

Macacus maurus, Is. Geoff. St. Hil. Voy. de Bélanger Zool. 1834, p. 63.

Papio melanotus, Ogilby, Proc. Zool. Soc. Lon. 1839, p. 31.

Cynopithecus speciosus, Lesson, Sp. des Mammif. 1840, p. 102.

Inuus (*Mainon*) *arctoides*, Wagner, Schreber, Säugeth. Suppl. vol. i, 1840, p. 146.

Macacus ursinus, Gervais, Hist. Nat. des Mammif. 1854, p. 93.

Inuus (*Inuus*) *arctoides*, Wagner, Schreber, Säugeth. Suppl. vol. v, 1855, p. 57.

Pithecus (*Macacus*) *arctoides*, Dahlbom, Stud. Zool. Fam. Aeg. An. 1856, pp. 116, 118.

Pithecus arctoides, Blainville, Ostéogr. Mamm. vol. i, p. 44, 1839-64, atlas ii, pl. vii (skull).

Macacus melanotus, Gray, Cat. Monkeys and Lemurs, B.M. 1870, p. 29.

Macacus brunneus, Anders. Proc. Zool. Soc. Lon. 1871, p. 628; 1872, p. 203, pl. xii (juv.); 1874, p. 652.

Inuus speciosus, Blyth, Journ. As. Soc. Beng. vol. xlv (1875), ex. no. p. 6.

SYNONYMY.

There has undoubtedly been much confusion in respect to the status of this species. The reason for this confusion may be due to three main causes, namely, (a) that the original description was based on a drawing by Duvaucel; (b) the lack of sufficient material; and (c) the lack of our knowledge of the changes, both external and internal, exhibited by this species from birth to maturity. With the material I have before me, nine specimens collected by myself and a single male collected by Mr. F. C. Lowis, I shall



‘Close up’ of the face of a male Stump-tailed Macaque (*M. speciosa* F. Cuv.).



A ‘Close up’ showing profile of face and long shaggy coat of a male Stump-tailed Macaque (*M. speciosa* F. Cuv.).

Photos by Author.

endeavour to fill certain gaps. All my specimens were obtained in the Naga Hills, Assam, while I was on expedition work in that region from January to March, 1930. This expedition afforded me a splendid opportunity of collecting and observing this species in its natural habitat, whenever time allowed.

I have adopted the name *M. speciosa* F. Cuv. in preference to *M. arctoides* Is. Geoff. because Cuvier's name antedates the latter by eight years. In spite of the fact that Cuvier (1825) described the animal from a drawing by Duvaucel, authorities appear to be agreed that it is the same species described by Geoffroy eight years later (1833), regardless of the fact that no locality is given to Cuvier's type and that the type does not exist. According to Anderson (*An. Zool. Res.* 1878, p. 50), the drawing made for Cuvier was of a specimen in the Barrackpore Park, and he (Anderson), after considering Temminck's view, namely, that the drawing was made of a Japanese monkey, remarks that:—

'There is, however, no evidence to support such a view; and within the last few years, since my attention has been directed to this subject, four examples of these brown, red-faced, stump-tailed monkeys have passed under my notice in the Calcutta market, and all of them had come from the Assam region or Cachar. As F. Cuvier's drawing of *M. speciosus* is a better representation of these monkeys, all of which are referable to *M. brunneus* and *M. melanotus*, than it is to the Japan ape, with its differently coloured fur and rather long well-clad tail, as markedly distinct from the tail of *M. arctoides*, it seems highly probable, that F. Cuvier's drawing is founded on an animal of the Assam or Cachar region that had probably been presented to the Viceregal collection at Barrackpore by some Government official—a source from which the menagerie has been frequently enriched, and to which it has always been more or less indebted from its commencement. The second example of *M. brunneus* that came into my hands was given to me with the option of presenting it to the Barrackpore collection.

'There can be no doubt that while the drawing of *M. speciosus* is not a good representation of the Japan monkey, it is so of the form from the Cachar and the Kakhyen hills on the frontier of Yunnan; and as *M. arctoides*, which I hold to be the adult, is from Cochin China, if my hypothesis of the origin of the type of *M. speciosus* is rejected, there is the further alternative, as suggested by Temminck, that it may have come from some Javan port. If so the probability would appear to be that it was carried to Java by one of the trading vessels between that island and Cochin China and not from Japan.'

Blanford [*Fauna British India* (Mammalia) 1888, p. 18] referring to the nomenclature of this species writes:—

'Blyth refers the present form to *M. speciosus* of F. Cuvier, a name generally applied to a Japanese species, and Anderson is disposed to concur. *M. speciosus* is said by Temminck (*Fauna Japonica*) to have been founded on a drawing by Diard or Duvaucel of a monkey living at Barrackpur near Calcutta. The figure resembles a pig-tailed Monkey (*M. nemestrinus*) with most of the tail cut off as much as it does either *M. arctoides* or the Japanese species. I agree with Anderson that the name *M. speciosus* should be dropped.'

It is quite clear from the comparison of the respective statements of Anderson and Blanford that the former was of the opinion that Duvaucel's drawing was that of *M. speciosus* F. Cuv. and not of the Japanese monkey as stated by Blanford. Anderson merely adopted the name *M. arctoides* Is. Geoff. on the ground that the type of Geoffroy's description existed in the Paris Museum, as is clearly seen from his own remarks (l.c. p. 51): 'I

have adopted the term *M. arctoides* in preference, because the type of the former exists in the Paris Museum,¹ whereas the latter solely rests on a drawing by Duvauzel reproduced by F. Cuvier.'

If Cuvier's description was ample to distinguish the species and he was the first to describe it, I see no reason why his name should not be accepted, as it is the oldest. In which case *Macacus speciosus* has the right of priority over *M. arctoides* of Geoffroy. The late Mr. Oldfield Thomas² [*Proc. Zool. Soc. Lon.* (1927), p. 43] adopts Geoffroy's name of *M. arctoides* mainly on the ground that Geoffroy's specimen has a definite locality and that the type is preserved in the Paris Museum (like Anderson), whereas Cuvier's rests on a drawing without any locality. As we have seen above, the drawing was made at Barrackpore Park and from the evidence before us the specimen probably came from Assam, which seems most likely. Mr. Pocock refers to this species under the name *M. speciosa* in his paper on *The External Characters of the Catarrhine Monkeys and Apes*, *Proc. Zool. Soc. Lon.* (1925), p. 1497. In a footnote to the same paper (p. 1571) Mr. Pocock says "I entirely agree with those authors who maintain that Cuvier's description and figure of *M. speciosus* apply to the short-tailed Burmese Macaque and not to the Japanese Macaque (*M. fuscata*).'' Then again, Mr. Pocock (*J.B.N.H.S.*, vol. xxxv, 1931, p. 297) refers to this species as *M. speciosa* in a foot-note to his paper on 'The Pig-tailed Macaques (*Macaca nemestrina*)', but I can find no paper on the revival of this name. Undoubtedly Mr. Pocock had a good reason for adopting it. Considering the facts that: (a) Cuvier was the first to describe it; (b) though his description was based on a drawing, without locality, it was sufficient to recognise the species; and (c) most, if not all, systematists are agreed that Cuvier's *M. speciosus* is conspecific with Geoffroy's *M. arctoides*, there is no alternative but to accept Cuvier's name in place of Geoffroy's which it antedates by eight years.

DESCRIPTION.

Coat: In order to facilitate description, I propose to consider my specimens individually according to their approximate ages.

Newly-born: No. 12, ♂, Lakhuni, ca 2,000 ft., 2-2-30. This specimen was brought in alive. The general colour of the fur was creamy-white with a light brown tint showing up over the rump. A few days later similar small brown patches appeared over the scapulars. Limbs creamy-white. Tail very thinly clad with white hair. The face, hands, ears, testes and buttocks flesh-pink—the colour was slightly intensified when the animal was irritated. As the animal grew older the brown patches appeared to intensify very rapidly. The hair of the neck and shoulders was distinctly longer (27 mm.) than the rest of the body (rump 15 mm.). Unfortunately the animal died.

The following is a description of the skin in its present condi-

¹ The italics are mine.

² Mr. Thomas withdraws his opinion expressed here vide *Proc. Zool. Soc. Lond.* (1928), p. 142.



Adult male and female of the Stump-tailed Macaque (*M. speciosa* F. Cuv.).



Hindquarters of male Stump-tailed Macaque (*M. speciosa* F. Cuv.) showing abbreviated tail.

tion, as it is of interest. Head very pale yellowish white intensifying in tone on the shoulders; small brown patches over the scapulars; the brown on the rump very marked, with a distinct spinal streak rising towards the scapulars; the limbs suffused with a very pale brown. Chest and abdomen thinly clad with light hair.

Yearling: No. 71, ♂, Changchang Pani, 500 ft., 2-2-30. General colour light brown with distinct darker vandyke-brown behind the head and on the rump. The brown appears as though it would have gradually spread all over the body. This point we shall see presently confirmed in specimen No. 135. The brown behind the head is interspersed with light hairs. There is no indication of moult. Limbs uniformly brown like the body, but paler on the insides. The colour of the face and other soft parts when in the flesh, was flesh-pink tinged with ochre. Chest and abdomen well clad with light brown hair. Hairs from the shoulders measured 37 mm. and from the rump 29 mm.

Immature females: No. 135, ♀, Changchang Pani, 500 ft., 26-2-30. General colour a rich vandyke-brown throughout, the darkened portions of the hairs accounting for this colouring; below the darkened portions of the fur is greyish brown. Head slightly lighter than the rest of the body. In this specimen there is no indication of the hair being annulated. Below the chin there is a small dark beard interspersed with light hairs. Chest and abdomen thinly clad with light brown hair. Soft parts flesh-coloured tinged with ochre. Hairs from the shoulders measure 66 mm., those of the rump 38 mm. and those of the chest 52 mm.

No. 139, ♀ Changchang Pani, 500 ft., 26-2-30. In general tone this specimen is much like No. 135, but the hairs are becoming distinctly annulated throughout. Vandyke-brown alternates with bright golden yellow. There are 3-4 annulations on each hair. This individual is older than the last (No. 135) as will be seen when I come to the comparison of the teeth. The chest and the abdomen is clad with brown hair. Soft parts as in the last. Length of hairs from the shoulder 74 mm.

Adult female: No. 137, ♀, Changchang Pani 500 ft., 26-2-30. General colour brown but lighter than the two immature females. The hairs are all distinctly annulated throughout—5-6 annulations to each hair. The whole animal now presents a grizzly appearance. Head slightly lighter than the rest of the body. Face and hindquarters pinkish purple tinged with deep purple and brown patches.

Adult males: No. 131, ♂, Changchang Pani, 500 ft., 22-2-30. In general appearance like the adult female (No. 137), but decidedly darker. Head lighter than the rest of the body. Hairs distinctly annulated—8-10 annulations to each hair extending for about $\frac{2}{3}$ its length down. Face sparingly hairy, much wrinkled, the main wrinkles running transversely and with minor reticulations between. The colour is a deep pinkish purple with pink and darker shades of purple and brown blotches. The hindquarters and testes are coloured like the face, the latter being a deep purple with brown patches.

No. 133, ♂, Changchang Pani, 500 ft., 26-2-30. Much like the last (No. 131).

No. 95, ♂, Changchang Pani, 500 ft., 9-2-30. This animal is older than the other two males. The coat is somewhat lighter and more grizzly. Hairs of the shoulder measure 115 mm. In this specimen there are as many as 16 annulations to each hair.

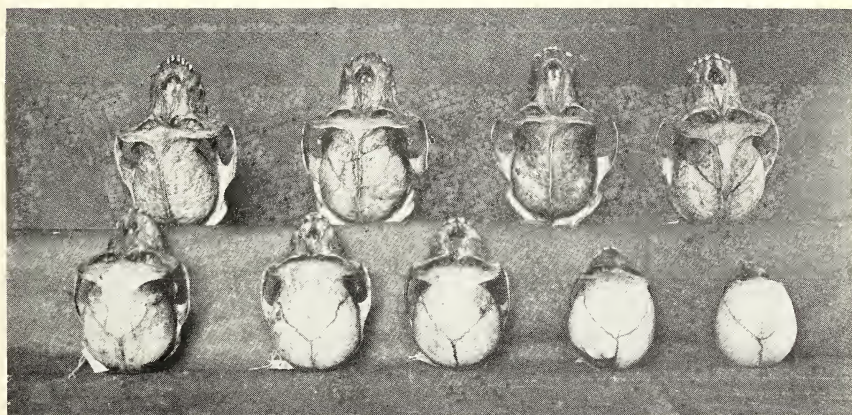
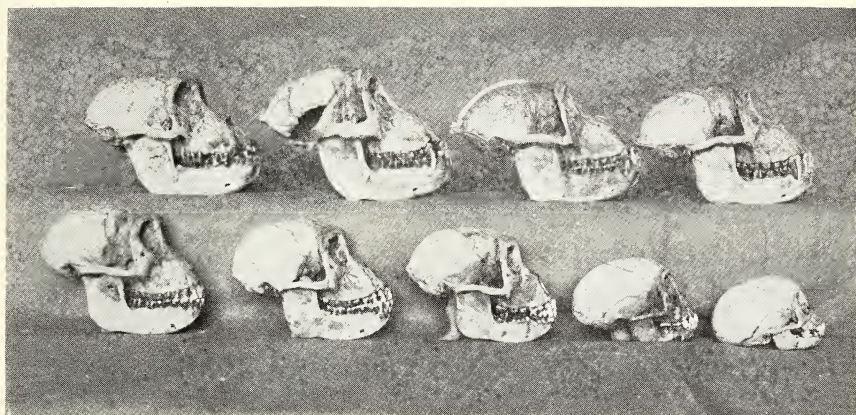
Old Male: No. 97, ♂, Changchang Pani, 500 ft., 13-2-30. This solitary old male is decidedly lighter than the other males described above. The coat is interspersed with entirely grey hairs. The coat is distinctly annulated. It is the bands of bright golden yellow which go grey before the other bands of brown. The chest and abdomen are poorly clad. The vivid colouring of the face and hindquarters as exhibited by the other males was completely lost, being a sallow colour. This animal was thin and emaciated. The face was haggard and the configuration of the bones could be clearly seen—a good example of a wizened up old veteran. Other characters indicating age will be dealt with below.

A single specimen collected by F. C. Lewis is in the collection of the Bombay Natural History Society. It is an example of a male in the prime of life. It was collected 'between 20°.40' and 26°.45' on the western slope of Divide between Salween and Irrawaddy' in 1914. This specimen is more ferruginous along the flanks than those collected in Assam. The dorsal region is somewhat darker. The head is decidedly more grizzly above and darker behind than Assam specimens. No measurements are given.

The following gives the measurements of the animals taken in the flesh:—

No.	Sex.	Locality.	Head and body.	Tail.	Hind foot.	Ear.	Chest ¹	Belly ¹ .	Loins ¹ .
97	♂	Changchang Pani, 500' ...	585	40	185	33	355	570	334
133	♂	" " ...	630	70	172	35	470	590	400
131	♂	" " ...	565	76	160	35	378	554	340
95	♂	" " ...	577	56	158	32	423	505	324
71	♂	" " ...	345	25	83	27	...	...	...
12	♂	Lakhuni ca. 2,000' ...	250	40	83	27	...	...	...
137	♀	Changchang Pani, 500' ...	530	60	154	30	340	500	300
135	♀	" " ...	500	60	150	30	335	470	290
139	♀	" " ...	460	36	145	30	340	415	280

¹ The animals were slightly swollen when measured.



Skulls of the Stump-tailed Macaque (*M. speciosa* F. Cuv.) arranged according to age from left to right showing the variation of the contours. The same skulls are shown in the 3 photos.

Top row: Nos. 97; 133; 95; 131. Bottom row: 137; 139; 135; 71; 12.

Photos by Author.

ANATOMICAL CHARACTERS.

Vertebrae: Caudal 10, Sacral 3, Lumbar 7, Dorsal 12, Cervical 7. Ribs 12 on each side. Caudal vertebrae very considerably reduced towards the end.

Pelvis: The following table gives the principal measurements in millimetres:—

No.	Sex.	Length.	Upper width.	Lower width.	Callos	...
133	♂	163	119	93	44	Adult.
137	♀	141	95	83	36	„

Skulls: The following table gives the measurements of the skulls in millimetres:—

No.	Sex.	Total length.	Zygom. width.	Length of palate.	Orbit. width.	Length of molars.	Remarks.
97	♂	146	103	56	$\left\{ \begin{smallmatrix} 88^1 \\ 61 \end{smallmatrix} \right.$	$\left\{ \begin{smallmatrix} 40^2 \\ 27 \end{smallmatrix} \right.$	1st molar upper jaw right lost in life.
133	♂	156	116	63	$\left\{ \begin{smallmatrix} 92 \\ 60 \end{smallmatrix} \right.$	$\left\{ \begin{smallmatrix} 42 \\ 28 \end{smallmatrix} \right.$	
131	♂	141	99	57	$\left\{ \begin{smallmatrix} 79 \\ 56 \end{smallmatrix} \right.$	$\left\{ \begin{smallmatrix} 40 \\ 28 \end{smallmatrix} \right.$	
95	♂	151	104	55	$\left\{ \begin{smallmatrix} 88 \\ 60 \end{smallmatrix} \right.$	$\left\{ \begin{smallmatrix} 41 \\ 28 \end{smallmatrix} \right.$	Left lateral incisor not developed.
71	♂	93	62	30	$\left\{ \begin{smallmatrix} 50 \\ 41 \end{smallmatrix} \right.$	$\left\{ \begin{smallmatrix} 0 \\ 15 \end{smallmatrix} \right.$	Milk dentition complete.
12	♂	80	51	22	$\left\{ \begin{smallmatrix} 42 \\ 37 \end{smallmatrix} \right.$	—	Only one molar through gums.
137	♀	122	83	46	$\left\{ \begin{smallmatrix} 69 \\ 51 \end{smallmatrix} \right.$	$\left\{ \begin{smallmatrix} 37 \\ 25 \end{smallmatrix} \right.$	
135	♀	115	79	44	$\left\{ \begin{smallmatrix} 64 \\ 49 \end{smallmatrix} \right.$	$\left\{ \begin{smallmatrix} 30 \\ 18 \end{smallmatrix} \right.$	Last molar not cut.
139	♀	127	86	48	$\left\{ \begin{smallmatrix} 0 \\ 53 \end{smallmatrix} \right.$	$\left\{ \begin{smallmatrix} 38 \\ 26 \end{smallmatrix} \right.$	Last molar just appearing.
nil	♂	151	102	58	$\left\{ \begin{smallmatrix} 82 \\ 63 \end{smallmatrix} \right.$	$\left\{ \begin{smallmatrix} 37 \\ 25 \end{smallmatrix} \right.$	Collect by F. C Lowis.

¹ The numerator denotes the external orbital width and the denominator the internal orbital width.

² The numerator denotes the length of molars and premolar combined and the denominator the length of the molars alone.

Below I give the progress of the cranial characters as development takes place according to the approximate ages of the specimens:—

No. 12, ♂. Bones not fused. Muzzle very short; a slight indication of the postorbital process of frontal bone. Point of union of the frontals clearly visible. Orbital portion of malar bone laterally oblique; not markedly widened. Orbital ridges of frontal not pronounced. No bony partition between the palatine foramina. *Teeth*: The formula for the milk-teeth as in the genus,

I. $\frac{2-2}{2-2}$, C. $\frac{1-1}{1-1}$, M. $\frac{2-2}{2-2}$. In this specimen the incisors have

been completely erupted in both the upper and lower jaws. Canines have just pierced the gums. 1st molar in both jaws erupted, quadri-cuspidate; the lower molars are slightly longer than the upper.

No. 71, ♂. The dovetailing of the cranial sutures distinct. Frontals completely fused; muzzle slightly more protruded than in No. 12. Postorbital processes of frontals distinctly prolonged into a sharp point. Orbital portion of malar wider and its face directed more forward. Orbital ridges of frontals distinct. Slight indication of septum between the palatine foramina. *Teeth*: Full set of milk-teeth erupted; incisors show signs of wear. Canines fully cut.

No. 135, ♀. Bones completely fused. Muzzle pronounced. Postorbital processes of frontals distinct and well developed; orbital portion of malar wide with its face directed forward. Two distinct cranial ridges arise from the orbito-malar suture and traverse the cranium in a backward curve. Septum of palatine foramina formed. *Teeth*: Formula for permanent set as in the

genus— I. $\frac{2-2}{2-2}$, C. $\frac{1-1}{1-1}$, Pm. $\frac{2-2}{2-2}$, M. $\frac{3-3}{3-3}$. In this speci-

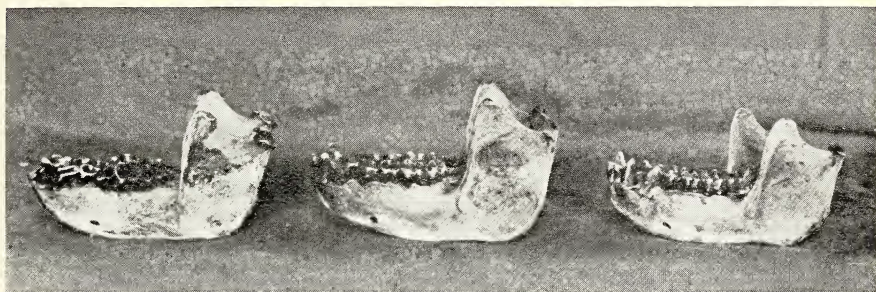
men only 28 teeth have been erupted. The incisors exhibit considerable wear in the upper jaw, the cutting edges have been worn down flat; in the lower jaw the chisel edges are retained; canines pre-molars and the 1st and 2nd molars only erupted. The wear indicated by the 1st molar shows that it is erupted before the pre-molars. In the lower jaw the 2nd premolar of the right side has not been cut, but the new tooth is visible in the cavity.

No. 139, ♀. Bones as in the last but showing greater strength and development. The cranial ridges are more clearly pronounced. *Teeth*: The condition of the teeth in this specimen is as in the last (No. 135) except that the last molars of the upper jaws are just cutting the gums, while those of the lower jaw have been almost completely erupted. The premolars show slight signs of wear.

No. 137, ♀. Bones as in the last. Cranial ridges converging towards one another. In the females the cranial ridges do not fuse to form a single crest as in the males. *Teeth*: All the teeth with the exception of the last molars show signs of wear; the



Nos. 137; 139; 135 71; 12.



Nos. 97; 133; 131.



Nos. 97; 133; 131.

Skulls and lower jaws of the Stump-tailed Macaque (*M. speciosa* F. Cuv.
showing the dentition.

Photos by Author.